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Culture and climate change scenarios: the role and potential of the arts and humanities in responding to the '1.5 degrees target'

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This paper critically assesses the role and potential of the arts and humanities in relation to the '1.5 degree target' embedded within the Paris Agreement. Specifically, it considers the purpose of scenarios in inviting thinking about transformed futures. It includes a preliminary assessment of the *Culture and Climate Change: Scenarios* project, an example of arts and humanities engagement with a '1.5 °C future'. The paper argues that integrating more culturally rooted contributions into the creation and deliberation of climate change scenarios would enrich processes of future-thinking beyond climate model outputs. It would also test and extend some established practices of climate research and policy in anticipating and making futures. The paper suggests that the key characteristics of scenarios as a cultural form are that they provide space for collective, improvisational and reflexive modes of acting on and thinking about uncertain futures.

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Introduction

The 2015 COP21 Paris meeting of the United Nations Framework Convention on Climate Change (UNFCCC) gave new impetus to the task of imagining a range of future worlds by shaping an international deal around an ambitious new target: to 'pursue efforts to limit the temperature increase to 1.5 degrees Celsius above pre-

industrial levels' [1]. The prior 2 °C target served as an 'anchoring device' for climate science and policy for almost 20 years [2,3]. However it was also 'a fiercely debated threshold'; its scientific basis was considered 'tenuous' and it was deemed 'infeasible, expensive, and an inappropriate way of framing climate policy [4–6,2]'. Even before Paris, the emerging 1.5° target was judged by some to be 'no longer within reach' [4,7,8]. Recent research has argued that there is just a 5% chance that temperatures will rise by less than 2 °C and a 1% chance of staying below 1.5 °C [9]. 'Targeting 1.5 °C' can thus be better understood as a grand collective wish rather than a prediction or even a plan [10,11–13]. This target nevertheless provides a discursive context for addressing the creative scenario work that will be needed to understand and pursue this goal.

The processes of the Intergovernmental Panel on Climate Change (IPCC) and UNFCCC lean heavily on scenarios to explore and present potential future climate risks and responses. Specific details derived from emissions scenarios in the series of IPCC Assessment Reports (1990–2014) have become central planks in 'communication to activate' strategies [14–16]. Totemic numbers warning of 'tipping points' or thresholds to profound social and environmental changes have included '450 ppm CO₂' and 'two degrees of warming' [17]. The majority of IPCC and UNFCCC discourse around scenarios can be summarized as a body of technically driven accounts derived from a mix of natural science and economics research. Climate science is asked 'to furnish policymakers with "regulatory science" and to anticipate and measure the performance of policies in the future' [18•]. The underlying issue is of 'characterising uncertainties' both within and beyond the practices and politics of reasoning about the future inherent in IPCC assessment processes [19]. The IPCC is enmeshed in the 'politics of anticipation' and as such drawn into 'making futures not just forecasting them' [18•]. The IPCC's evolving responsibilities inevitably range across ethical, political and cultural terrain. Yet these normative dimensions of future-thinking are scarcely acknowledged within the formal processes [16].

Moreover, the arts and humanities are almost entirely absent in the scenarios work of the IPCC and the UNFCCC, even though the concept and practice of scenario making originates in these disciplines. Acknowledging the historical and cultural roots of scenarios, and

opening up the imaginative practices of climate research to more collaborative working with these fields of inquiry, might support a more vibrant and imaginative sense of how humanity can be prepared for societal transformations and uncertain futures. The arts and humanities do not offer an instant remedy to challenges of public engagement in complex research and policy processes, or resolve research-meets-policy tensions, but they can open up more expansive understandings of the many ways in which the world is being altered, or might be in future, not simply physically but also culturally and imaginatively, by the ‘difficult new knowledge’ surrounding climate change [20–22].

This paper emphasises the importance of ‘cultural work’ on climate change. As Mike Hulme writes, ‘however our contemporary climatic fears have emerged [. . .] they will in the end be dissipated, reconfigured or transformed as a function of cultural change’ [23]. It also aligns with Karen O’Brien’s proposition that the transformational thinking required by climate change, involves cultural changes along with shifts in perspectives and practices: ‘(p)olicies and decisions associated with transformation extend beyond the status quo, and often challenge traditional ways of thinking about things, doing things, and planning for the future’ [24]. This extended terrain calls for new strategies of ‘deliberate transformation’ [25], that recognise different understandings of agency and human–environment relationships and are an adaptive challenge in themselves [26,27].

We argue that a focus on the creation of ‘scenarios’ of climate-changed futures offers particularly fertile ground for the exploration of these themes, both within the IPCC and in the wider culture. We suggest that it is time to not only review scenarios thinking but also to recognise the transformative potential of cultural work and the role of the arts and humanities in the public spaces of climate research. We conclude the paper with a preliminary assessment of the *Culture and Climate Change: Scenarios* project, a ‘worked example’ of sustained arts and humanities engagement with scenarios of a 1.5 °C changed future.

Scenarios: anticipating and making futures

Scenario thinking has long been a prominent strand in the work of the IPCC and the UNFCCC, and draws on predictive scientific knowledge, based on computer models and simulations. It is possible to trace a shift in the way the IPCC Assessment Reports have discussed scenarios: from predictions to projections to storylines and now pathways [28–30]. The IPCC is careful to state that scenarios of human induced climate change and resource depletion are not intended as predictions: ‘The goal of working with scenarios is not to predict the future but to better understand uncertainties and alternative futures, in order to consider how robust different decisions or options may be under a wide range of possible futures’ [16]. The

IPCC’s latest approach to emissions scenarios, or Representative Concentration Pathways (RCPs) is intended to serve as a way of ‘opening the future’, and to encourage people to shape the future they want rather than select from a set of predetermined futures [29]. The new generation of scenarios includes the shared socioeconomic pathways (SSPs) [31] developed together with the RCPs and shared policy assumptions for mitigation and adaptation (SPAs) [32–36].

While RCPs make no assumptions about the kinds of society that generate global greenhouse gas emissions, SSPs describe plausible future conditions and alternative trends for 21st century society. Because SSPs are supposed to be plausible they cannot deviate from current societal conditions, or make any concessions for individual or collective agency, motives, emotions or the value-driven and deliberate transformations of cultural and societal change. In short these scenarios work to eliminate agency, conflict and non-linear change despite the fact that these are all key aspects of the uncertainties of living with climate change. Such scenarios are indicative of the ‘cultures of prediction’, which pervade the science and cultural politics of global environmental change and where other forms of knowledge (such as indigenous understandings), and meaning-making (for example via arts and humanities) are marginalised [37].

The authoritative status of scenarios within formal climate change research and policy processes is thrown into relief by a better understanding of the history of this practice of ‘future making’ [38]. The term ‘scenario’ has its origins as a cultural form in the improvisations of Italian baroque street theatre, where it indicated the synopsis of a play. Scenarios were a prompt to performances that responded to the complexities of the everyday, revealing the relations, emotions, values and motives of societal conditions. In Hollywood’s silent movie era ‘scenarios’ referred to screenplays. In the 1960s the word was borrowed to describe the strategic planning techniques that involved systems thinking, or ‘scenarios’ for nuclear warfare developed by Herman Kahn with the Rand Corporation. Kahn’s techniques for thinking in terms of multiple possible futures set the standard. His futures included ‘the unthinkable’, and evaluation and selection of the most and least desirable futures, known as ‘best-case’ and ‘worst-case’ scenarios [39,40]. Perhaps the best-known scenario analysis associated with global environmental change debates is the 1972 publication, *Limits to Growth*, based on the World3 computer model [41]. Since that time scenario and forecasting techniques have been widely applied in business and policy. Most notably, from the early 1970s onwards, Shell developed a method of scenario planning that was designed to help the company anticipate and adapt to future shocks and turbulence [42]. The synthetic storytelling inherent in scenarios is prized for being open as much to ‘bizarre crises’

(in Kahn's terms [40]) and contingencies as to contested outcomes and alternative pathways. Scenarios are often posited as 'learning machines': they are heuristic tools for climate policy strategies, and they make sense of the future by asking, 'what if?' [43].

Scenarios inhabit the culture in diverse forms and are 'defined in various, contested ways, involving a wide range of methodologies and philosophies' [44]. For example, the SSP and RCP scenario developments 'combine different symbolic systems, from numerical modelling to literal descriptions' [45], all resulting in their own methodological challenges [46]. As 'anticipatory practices' [47], scenarios are enrolled in varying ways of calculating, imagining and performing futures, in often disputed modes of 'pre-emption, prefiguration, and preparedness'. As such they contribute to processes through which the present is transformed, intervened in and ultimately governed in the name of the future [47]. Technologies of forecasting and intervening in the future can be shown to have developed in tandem with the forms of politics and practices of environmental anticipation of widely diverging interests [48]. The concept of 'anticipatory adaptation' has emerged to refer to proactive strategies for preparing communities for future change [49]. This is accompanied by a turn to scenario planning and analysis within government climate change adaptation initiatives that are attempting more reflexive approaches to futures [44]. These include examples of integrated modelling of uncertainties and adaptive strategies [50], and participatory scenarios that attempt to integrate local knowledge with climate science [51,52]. Among the grand challenges of the Future Earth programme — a consortium initiative of integrative global environmental change research [URL: <http://www.futureearth.org>] is to 'improve the usefulness of forecasts of future environmental conditions and their consequences for people' [53].

The scenario mode is more than just a tool, method or technique, however. It covers a broad spectrum of imagined climate futures from climate models and forecasts through anticipatory practices and actions [48,54,47], to the thought experiments of a fossilized future that lies at the core of the proposed Anthropocene epoch [55,56]. However, what is often lost with all this forward looking are the improvisational and reflexive intentions that were part and parcel of the origins of scenarios as a situated cultural form. We thus suggest a renewed focus on scenarios of climate-changed futures, not simply as improved narratives or more useful forecasts but instead as the stage or 'rehearsal space' for a diverse, multidisciplinary and collective undertaking of social transformations.

Arts and humanities responses to climate change

There has been growing recognition of the need for more prominent humanities contributions to climate change

research [57,58,24]. It has been suggested that such a shift in the 'intellectual climate' involves incorporating overlooked environmental humanities writing on, for example, values, responsibilities, rights, perceptions, faith and care pertaining to the 'human dimensions' of global environmental change [59], and that the IPCC should extend engagement to unrepresented disciplines including philosophy or musicology [60]. In similar vein Beck and Mahony have challenged the IPCC to 'open up', inviting 'a broader range of academic disciplines to contribute to exploring more flexible, more inclusive, and arguably, more effective approaches to societal transformation' [18**].

There are valuable foundations to work from. There is analysis and debate of the interrelations of climate and culture from across the arts, social sciences and humanities [61–65,20,66,21,22,67,68]. An evolving literature is exploring climate change narratives on film and television [69–72], broadcast, print and online news media [73,74], literature [75**,76–78], theatre [79,80] and museums [81]. There are also examples of work within the humanities and social sciences that explicitly connect culture — whether through recourse to cities and urbanisation or climate and science fiction — to climate science scenarios [82,83,45,38]. Nikoleris *et al.*'s recent paper initiating a conversation between literary and scientific scenarios explored how, 'literary fiction brings the worlds imagined by SSPs to life through its particular accounts of agency and focalized perspectives' [45]. Nerlich and Jaspal's survey of the conceptual and discourse metaphors surrounding geoengineering [84] illustrates the potential of humanities research in understanding the language surrounding adaptation and mitigation scenarios. The humanities and critical social sciences can also serve to support a more expansive understanding of the processes of the IPCC itself: social scientists now enjoy access to its meetings to study the epistemic and political complexities of climate-knowledge making [85]. Calls for an 'opening up' of climate science to cultural work have also been echoed in the arts community where for example, writer Tony White has called for better storytelling and 'deep and long-term engagements' with 'writers and artists in residence at the IPCC' [86].

The authors of this paper have consistently argued that 'climate change requires multiple framings and perspectives, and that these need to be provisional and evolving' [20]. An 'adding in' of humanities disciplines to the IPCC or an 'improvement' in science communication or better narratives of climate-changed futures won't in themselves be adequate. Climate change augurs as dramatic a shift in society as it does in sea level rise. This implies a vast process of social transformation, upheaval and disruption that will revise how many people think about and respond to their relationship with the non-human natural world. While such considerations are beyond the formal scope of

the IPCC as a provider of aggregate knowledge for the UNFCCC, its media and political prominence means that it is inevitably embedded within multi-layered processes of social learning about climate change and its imagined futures. Hence we argue that it should work to become more aware of, explicit about, and adept in relation to, this role.

The phrase ‘pursue efforts’ in relation to the ‘1.5 °C above pre-industrial levels’ target [1] presents the IPCC, an institution that ‘mediates between climate science, governance and policy’ [11], with a novel puzzle. The question for the arts and humanities is whether they can do ‘more than mediate science’ and might rather be considered to have ‘transformative’ potential [68]. To this end we have argued for more ambitious cultural work on scenarios — as purposeful as any climate modelling exercise — to both expand the scope of anticipation and the rehearsal of possible futures. The point is not that more expansive cross-disciplinary collective scenario-making will identify more truthful, desirable or even more plausible accounts of the future. Instead we suggest that these collaborative future imaginings might better respect some of the characteristics of climate change, including its radical uncertainties.

Culture and climate change: scenarios

The *Culture and Climate Change: Scenarios* project was launched in Paris at the UNFCCC COP 21 in December 2015 with the ambition of bringing greater cultural depth to public conversations about future climate scenarios (URL: <http://www.cultureandclimatechange.co.uk/projects/#scenarios-sixteen>). The project involved the appointment of four artists who between July 2016 and June 2017 took part in an experimental model of ‘networked residencies’, which explicitly sought to both mirror and engage with the distributed but interconnected nature of climate research. The *Scenarios* project has challenged the prevalent tendency amongst the climate change research, policy and arts communities to view cultural responses as late-phase communications or public engagement aids that come after the science and policy are done. The project started from the presumption that arts and humanities practices were not a response to, but rather an expression, and component of, climate research.

The project has aimed to test ways of expanding the imaginative registers that living with uncertain climates might mobilise, and to explore knowledge making in climate research through the principles and processes of co-production [87]. The experimental and co-productive elements of the *Scenarios* residency centred on the structuring of a sequence of hybrid and experimental encounters with different researchers and between different modes of climate change knowledge making and sharing. The improvisational and reflexive intentions inherent in scenarios were a touchstone for the project. Our framing for

the project was one of ‘collective improvisations’. This referred to both the origins of scenario making in improvised street theatre and the ‘collective experiments’ [88] of climate change. It drew on Bruno Latour’s observation that laboratories had turned ‘inside out’ to become ‘the world wide lab’ such that ‘we are all engaged in a set of collective experiments’ in the ‘confusing atmosphere of a whole culture’ [88]. This resonated with cautions regarding how the predictive knowledge of climate research tends to set the terms for running a worldwide sociocultural experiment, that is, ‘bringing the worldwide emissions of greenhouse gases under directed management’ [89]. With this context in mind we proposed, paraphrasing artist Joseph Beuys, that, ‘we are all climate researchers’. The challenge for the artists on the *Scenarios* residency was to open up thinking on climate scenarios in the wake of the Paris Agreement. This summary of their work hints at the potential of a sustained collaboration between the natural and social sciences, arts, and humanities in the public spaces of climate research.

Teo Ormond-Skeaping and Lena Dobrowolska have explored the scenario mode of their documentary photography and film practice in their project *Anthropocenes*. Their field-based research in Lao (PDR), Bangladesh and the UK has engaged with climate change adaptation and the ways in which climate science is reconfigured in specific localities. They have explored subjective aspects of vulnerability, the apparent de-politicisation of social vulnerabilities and the lack of recognition or neglect of indigenous knowledge of climate change in Lao, Bangladesh and the wider region. The artists have worked closely with climate resilience and adaptation specialists [90,91], including their notions of ‘useable knowledge’ [92]. In particular their filmic scenarios have responded to the arguments of Saleemul Huq and his colleagues at ICCCAD that, in addition to being vulnerable, Least Developed Countries (LDCs) such as Bangladesh are also in a position to take practical and intellectual leadership in demonstrating capacity to adapt to climate change (Figures 1 and 2).

Visual and sound artist and diver Emma Critchley’s *Human/Nature* project engages with the frontiers or thresholds of human reach, including the deep sea and deep space. Her audio-visual scenarios consider the embodied and experiential aspects of change in the non-human natural world. Her work aims to show the inseparable relationships between that domain and the distinctively human world of international politics. Critchley notes that, ‘in the same way that the CHM (Common Heritage of Mankind) principle was triggered by the insight of a small island in the middle of the ocean (Malta) witnessing first hand the sudden ‘exploration’ of rich mineral resources in the deep ocean floor, it was the most vulnerable nations (the Small Island States and the LDC group) who led the call in Paris for a 1.5-degree

Figure 1



The agent, his agency and the whale, 2016. Photo: Lena Dobrowolska and Teo Ormond-Skeaping.

Figure 2



Yet to be titled (Swaling #1) 2017. Photo: Lena Dobrowolska and Teo Ormond-Skeaping.

target.’ Recognition of the entanglements between the complexity of global climate politics, and their sonic, material and cultural reverberations shape Critchley’s experiential scenarios. They also ‘provide the opportunity to distill the complex and multi-faceted research involved in climate change and create imagined spaces . . . to stop, reflect and invite challenge and debate’. At the same time as acknowledging that climate target setting can indeed be a ‘prism of privilege, power and geography’ [93], such work both notes and further valorises knowledge

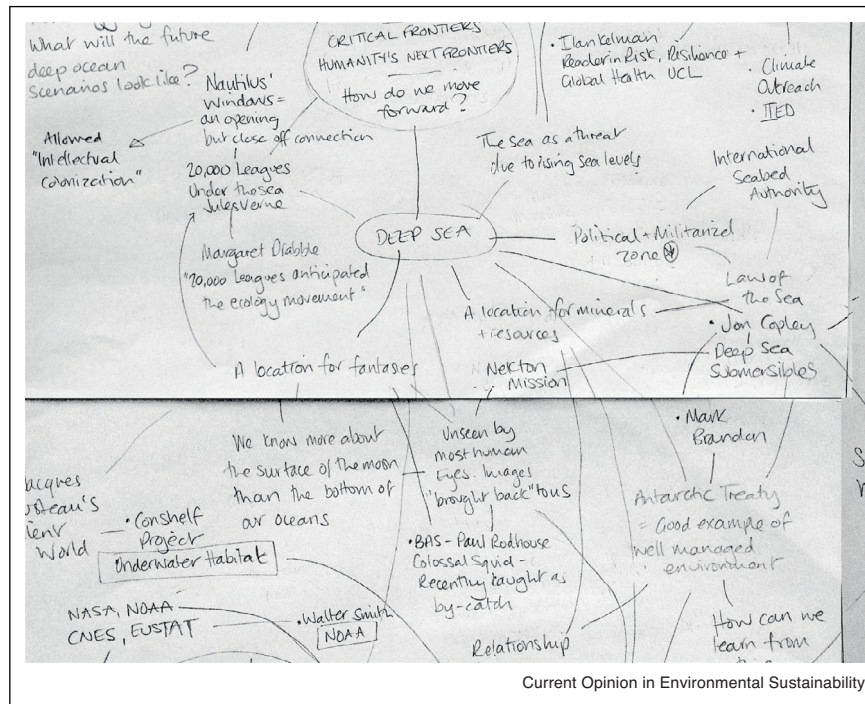
derived in and focused on the most climate-vulnerable societies and environments (Figures 3 and 4).

Theatre director Zoe Svendsen has used the residency to develop *WE KNOW NOT WHAT WE MAY BE*, a performance installation at the Barbican in September 2018 [URL: <http://metisarts.co.uk/we-know-not-what-we-may-be/>]. Svendsen was drawn to the economic and related social and cultural consequences of taking the idea of a ‘1.5 degree world’ seriously. Her investigations have been rooted in a series of ‘research in public’ conversations with economics, politics, business and social science climate researchers. They have been challenged to imagine what it might feel like to live in a society, and economy, designed in the best possible way to respond to climate change; effectively, a scenario in which the 1.5 degree target had been achieved, and ‘target attainability’ issues overcome [94,95]. Her research in public has led her to ask: ‘But is the Paris Agreement all a fantasy? . . . a kind of collective fiction? . . . By buying into the fiction that limiting emissions to 1.5 degrees is plausible in the current policy context, there is a collective denial of the urgent need to make radical, extreme change to our socio-economic conditions.’ The challenge is therefore to rehearse alternative futures, and the *Culture and Climate Change: Scenarios* artists are developing varied public invitations to do so (Figures 5 and 6).

Conclusion

Our work with the *Culture and Climate Change: Scenarios* project has generated some key insights. First, we contend that the presence or proximity of arts and humanities in relation to IPCC deliberations of ambitious policy goals can help to set the conditions for a more discursive, open, energetic and engaging account of this hugely ambitious body of research. In so doing the arts and humanities support a fuller understanding of what it means to craft shared futures with others through ‘conscious social transformations’ [24], or indeed to ‘make and unmake futures that impact on all life on this planet’ [48]. Second, the arts and humanities inhabit the (usually fractured) join between ‘fact-making’ and ‘meaning-making’ [96] and we suggest that this position allows them to support future imaginings that might better reveal a world of multiple, differentiated and uncertain futures. Furthermore, the arts and humanities are not a ‘communications finishing school’ for climate research and policy. They do not exist to simply provide an alternative account of those futures considered plausible and desirable and that can therefore be calculated, directed or corralled into being. Rather, the arts and humanities are essential to enriching scenarios work, even if that enrichment may arrive studied with challenges and provocations. Third, the collaborations around climate scenarios between the artists and their climate research community co-researchers (including ourselves as both convenors and participants) have served to recognise the diversity and contested

Figure 3



Climate research network 'mind map' for Human/Nature scenario by Emma Critchley, 2016. Photo: Emma Critchley.

Figure 4



Deep Sea Ecologist Dr. Kerry Howell & her robot, 2017. Photo: Emma Critchley.

Figure 5

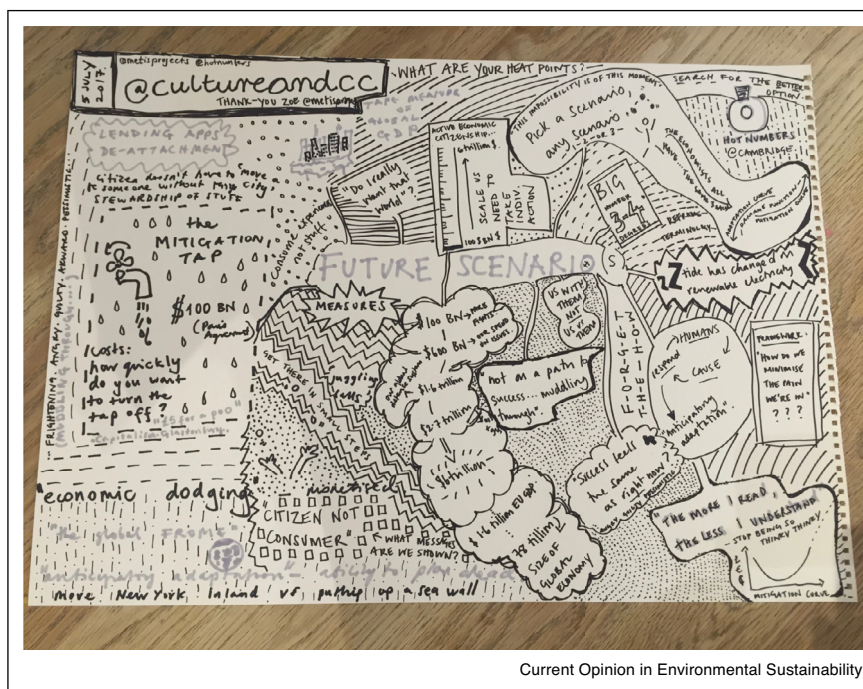


Zoe Svendsen presents her 'research in public' #2Degrees Festival Arts Admin June 2017. Photo: Renata Tyszczyk.

nature of climate change research, with its porous thresholds and 'indeterminate boundaries between science and its others' [97^{••}]. Scenarios work offers the potential to serve as a testing ground for understanding the possible impacts upon climate research itself of integrating the

kinds of research and practice that are constituent of the arts and humanities. This includes collaborative, multi-dimensional, multi-cultural and reflexive discussions suggestive of 'open-ended way(s) of thinking about futures' [46]. Finally, scenarios as 'collective improvisations'

Figure 6



Current Opinion in Environmental Sustainability

Notes from 'research in public' conversation between Zoe Svendsen and Stephen Peake, by Hannah Bird and Renata Tyszczyk, July 2017. Photo: Renata Tyszczyk.

invite a way of responding creatively to change that can cope with past and present disturbances and disagreements and the multiple and contested agencies of a dynamic planet. They can provide a 'rehearsal space' that may also result in more robust and considered responses in the near term to the prospect of the surprising social transformations that will inevitably be part and parcel of climate-changed futures.

Conflict of interest

The authors of this paper confirm that there are no conflicts of interest relating to this work.

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